

U.S. Naval Base, Pearl Harbor, Medical Clinic
(U.S. Naval Base, Pearl Harbor, Naval Station)
(U.S. Naval Base, Pearl Harbor, Pass and ID Office)
(Building No. 43)
Near Avenue "A" between First Street and Second Street, Lualualei
West Loch Branch Naval Magazine
Pearl Harbor
Honolulu County
Hawaii

HABS
HI
2-FEHA,
34-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

**Historic American Buildings Survey
National Park Service
Western Region
Department of the Interior
San Francisco, California 94107**

HABS
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2-PEHA,
34-

HISTORIC AMERICAN BUILDING SURVEY

U.S. Naval Base, Pearl Harbor, Medical Clinic *station*
(U.S. Naval Base, Pearl Harbor, Naval Magazine, Lualualei West Loch Branch)
(Pass & IO Office Building No. 43)

HABS No. HI-161

Location:

Near Avenue "A" between First Street
and Second Street West
Pearl Harbor
Honolulu County
Hawaii

USGS Pearl Harbor Quadrangle, Hawaii
7.5 minute series (orthophotoquad)
Universal Transverse Mercator coordinates
4.602800.2361420 (scale - 1:25,000)

Significance:

The U.S. Naval Base at Pearl Harbor was designated as a National Historic Landmark in 1964. As a Category 3 structure, it has been determined that Building No. 43 functioned as part of the Pearl Harbor Naval Base, but is only of minor importance to the historic character of the National Historic Landmark.

Description:

Building No. 43 is a single-story concrete masonry/wood structure, approximately 40 feet wide by 80 feet in length.

History:

Building No. 43 was constructed in 1943 to serve as a Decontamination Unit and Casualty Station at a cost of \$9,600. Building No. 43 is currently vacant due to its deteriorated state and its location within the explosive arcs of the Whiskey Wharves at the West Loch Branch of Naval Magazine, Lualualei. The last use for Building No. 43 was as a Medical Clinic/Pass and ID Office. Previous uses for Building No. 43 also include an Emergency Vehicle Garage, Educational Services Office and Operational Storage Area.

Sources:

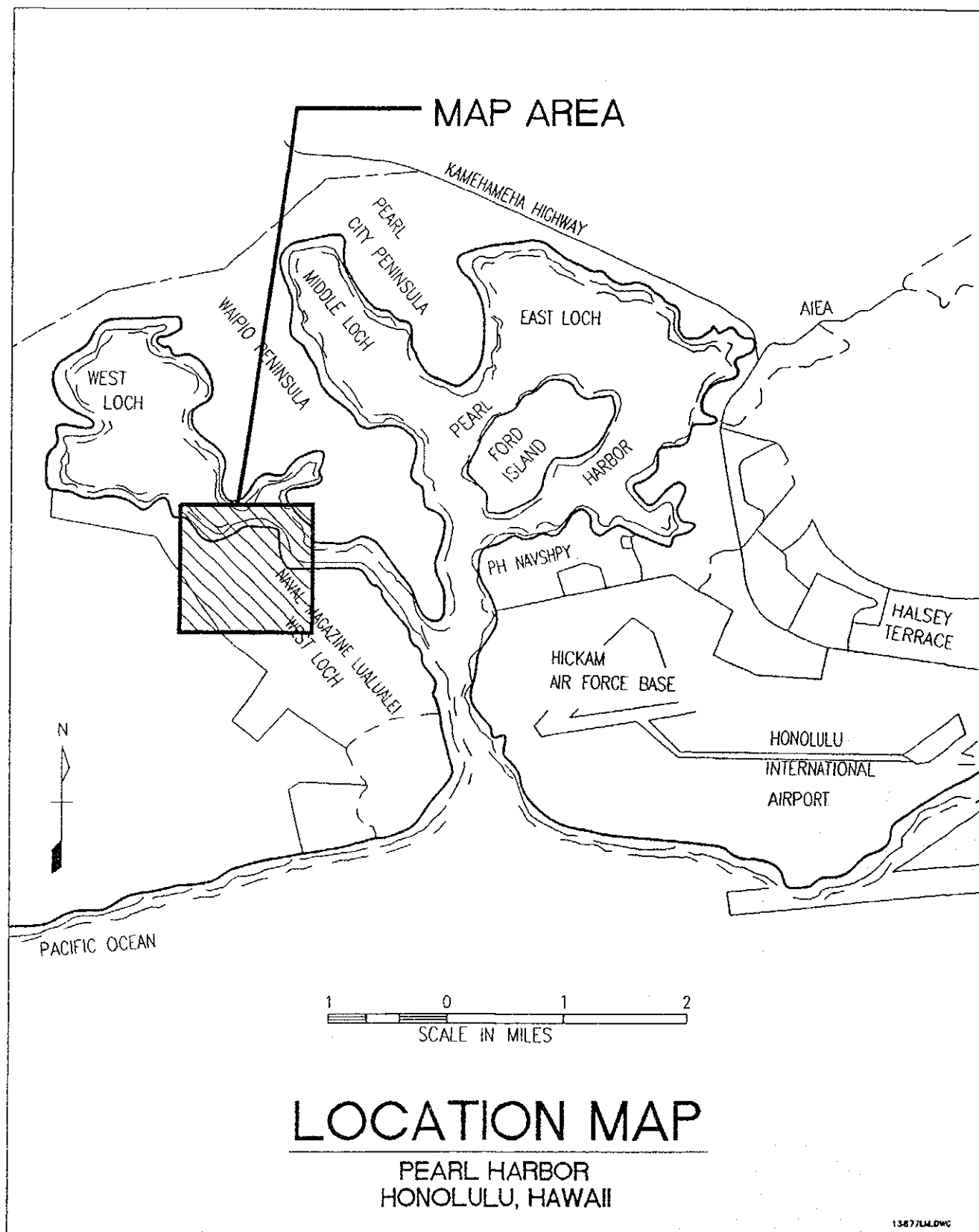
Pacific Division Drawing No. OA-N09-614 dated 5/44.

Historian:

Julie Muraoka, Civil Engineer
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Pearl Harbor, Hawaii 96860-5470
October 1993

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U.S. NAVAL BASE, PEARL HARBOR, NAVAL AMMUNITION DEPOT
WEST LOCH, OAHU, DISPENSARY
(U.S. Naval Ammunition Depot West Loch Branch, Oahu, Facility 43)
Near Avenue "A" between First Street & Second Street, Lualualei, West
Loch Branch Naval Magazine
Pearl Harbor
Honolulu County
Hawaii

HABS No. HI-161

ADDENDUM TO
U.S. NAVAL BASE, PEARL HARBOR, MEDICAL CLINIC
(U.S. Naval Base, Pearl Harbor, Naval Station)
(U. S. Naval Base, Pearl Harbor, Pass and ID Office)
(Building No. 43)
Near Avenue "A" between First Street & Second Street, Lualualei, West
Loch Branch Naval Magazine
Pearl Harbor
Honolulu County
Hawaii

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

Historic American Buildings Survey
National Park Service
Department of the Interior
Oakland, California

U.S. NAVAL BASE, PEARL HARBOR,
NAVAL AMMUNITION DEPOT WEST LOCH, OAHU, DISPENSARY
(U.S. Naval Base, Pearl Harbor, Medical Clinic)
(Facility No. 43)
HABS No. HI-161 (Page 4)

Addendum to
U.S. NAVAL BASE, PEARL HARBOR, MEDICAL CLINIC
(U.S. Naval Base, Pearl Harbor, Naval Station)
(U.S. Naval Base, Pearl Harbor, Pass & ID Office)
(Building. No. 43)

HISTORIC AMERICAN BUILDINGS SURVEY

U.S. NAVAL BASE, PEARL HARBOR,
NAVAL AMMUNITION DEPOT WEST LOCH, OAHU, DISPENSARY
(U.S. Naval Ammunition Depot West Loch Branch, Oahu, Facility 43)

This report is an addendum to a three page report previously transmitted to the Library of Congress.

The Record Name of this facility reflects the historic name and not the name by which it was known when first recorded. This facility was being referred to as a dispensary from almost immediately after it was built until at least 1974.

Location: Near Avenue "A" between First Street and Second Street, Lualualei West
Loch Branch Naval Magazine
Pearl Harbor Naval Base
City and County of Honolulu, Hawai'i
U.S.G.S. Pearl Harbor, HI Quadrangle 1999 (7.5 minute series)
Universal Transverse Mercator Coordinates 4.603100.2361070

Present Owner: United States Navy

Present Occupant: Vacant

Present Use: Vacant

Significance: Facility 43 is located within the Pearl Harbor National Historic Landmark and is a contributing element. It is significant for its association with the history of base development at West Loch and the buildup of Pearl Harbor in the months leading up to World War II. In addition it is significant as a good example of a modern style splinterproof medical facility constructed during World War II. It is one of three extant medical buildings on Oahu to follow similar plans. The other two structures, Facilities 22 and 48, are situated at NCTAMS (Fac. 22) and the Puuloa Training Facility (Fac. 48).

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Historical Context Section written by Dee Ruzicka.

Date of Report: October 2009

PART I. DESCRIPTION

Facility 43 was built ca. 1943 as a Type D Casualty Station. It maintained operational status until April 1993 when it was abandoned. It has remained vacant since that time with its windows and doors boarded shut. It is a single story, modern style building that is located on a flat parcel of land at West Loch. It is characterized by its masonry construction and flat roof with broad overhanging open eaves with exposed beam ends. The building has concrete masonry block walls and sits on a reinforced concrete slab foundation, which is raised one step above grade. It has a built-up composition roof with a 6" tongue and groove roof deck. Between the roof's outer membrane and its deck, a 4" thick reinforced concrete layer was poured in order to make the building splinterproof in the event of being bombed. Its 12" x 18" roof beams taper at the ends and support a 6' overhanging eave.

The rectangular shaped, approximately 66' x 42', building is eight bays long and five bays wide, with each bay demarcated by an exposed roof beam. The masonry walls have a skim coat of concrete and have a pair of one over one double-hung windows in each bay, except the corner bays, which have single-pane awning windows. The windows are located immediately below the eave line, and their sloping concrete sills are about 8' above the ground. All the windows are presently boarded over. Concrete posts, measuring 12" x 12" frame and articulate the windows.

The building faces west with a porte cochere extending outward approximately 16' from that side and running the width of the building. The porte cochere has a flat, built up composition roof, which is supported at the far side by 3' high 2" x 4" posts that rise from an 8' high, free standing concrete block wall. The stud framework is enclosed on the outside by 12" and 8" horizontal tongue and groove boards. Nineteen 2" x 4" roof rafters support the 8" tongue and groove roof deck. The porte cochere either replaced an earlier version or was added later, as Building 48 at Puuloa Training Facility displays a porte cochere whose roof is carried by the main building's end beams spanning the width of the porte cochere and supported by squat, 24" high, 12" x 12" reinforced concrete posts with beveled corners, sitting on a concrete block wall similar to that in Building 43.

A splinter wall, similar in construction and height to the main building's walls, runs parallel to the north side wall approximately 5' from the wall. It runs from the northwest corner of the building down the first three bays on that side. It protects an original hinged steel door which is in the third bay from the corner. A concrete sidewalk runs between the blast wall and the side of the building to the door.

The main entry to the building is on its west side. It is a double doorway opening, which no longer retains its original steel doors, and is situated in the second bay from the southwest corner. Another single hinged door, also of modern construction is located in the fourth bay along the west wall.

The interior of the building has been somewhat reconfigured to address changing functions over the course of time. The front waiting room, accessed through the single doorway in the west wall, remains very much intact. However, the original ward area, accessed through the west wall's double doorway, has been partitioned into several spaces to accommodate the split function of pass and ID office and Medical Dispensary. The original vinyl composition tile floor in the waiting room remains intact and has incorporated in its design the letters "NADWL" (Naval Ammunition Depot, West Loch) and a stylized Caduceus, with its double serpents entwined on a

staff surmounted by a pair of wings. The Caduceus is the symbol for the medical profession for much of the United States, including the military. The image in classical times was associated with the god Hermes, the messenger of the gods, who was also the god of merchants and thieves. In the seventh century A.D. it became associated with alchemy. It appeared on the chevrons of United States Army hospital stewards as early as 1856, and in 1902 was officially added to the uniforms of Army medical officers. After World War I the caduceus was employed as an emblem by both the Army Medical Department and the Navy Hospital Corps. The American Medical Association used the symbol for a time, but in 1912, after considerable discussion, abandoned it in favor of the staff of Asclepius. In classical times and still throughout most of the world the staff of Asclepius, an early Greek healer, is perceived, as a symbol of medicine. It is a wood staff with a single serpent entwined about it.

A central hallway leads from the former waiting room to the rear of the building. Near the rear of the building the central corridor opens to serve five rooms, some of which appear to have been examination rooms in recent times. The rooms at the end of the hall were developed in more recent times and have louvered doors. Off one of the rooms is a bathroom which includes a shower which appears to be lit by an original ceiling light with its glass tear drop cover.

Along the south side of the hallway, where an open ward originally was, are three office spaces with hollow core doors. On the north side is an original medical supply room with its counters and cabinetry, and adjoining it is a large operating room. A counter with cabinets above and underneath runs along the operating room's south wall and has a large sink with leg operated faucets. Its floor is covered with a 4" square composition tile with a similar base board. A steel door connects this room with the outside. In addition to the medical supply room, a doctor's office also stands between the waiting room and operating room.

PART II. HISTORICAL CONTEXT

Building 43 at West Loch, is one of three remaining splinterproof, Type D casualty stations built in Hawaii during World War II. The other two are Facility 22 at the Naval Computer and Telecommunications Area Master Station (NCTAMS) in Wahiawa (for a further discussion of splinterproof casualty stations during WW II, see HABS No. HI-522-C, U.S. Naval Base, Pearl Harbor, Naval Radio Station, Type "D" Casualty Station, Facility 22) and Facility 48 at the Marine training grounds at Puuloa (photographs of Fac. 48 are included in this report). Of the three buildings, Facility 43 retains the most historic materials on its interior, while Facility 48 presents the most original exterior.

To protect personnel against possible bombing attacks during World War II, the United States military constructed a number of bombproof and splinterproof buildings. The former were engineered to withstand a direct hit by a two thousand pound bomb (see HABS Report No. HI-391), while splinterproof buildings were built to protect personnel from bullets, bomb fragments or other flying debris resulting from bombs exploding near the shelter (See HABS Report No. HI-390). Casualty Stations were designed to be splinterproof in order to protect patients as well as the highly trained medical staff. The construction of bombproof and splinterproof buildings was in large part a post-December 7, 1941 precaution, with such facilities only found at military installations in Hawaii and the west coast of the United States.

Facility 43 was one of nine casualty stations constructed at Pearl Harbor during World War II. Most followed a standard plan referred to as "Type A"; however Facility 43 followed a Type D design, as did Facility 48 at Puuloa and Facility 22 at NCTAMS. These buildings differed from other Casualty and Decontamination buildings with their flat roofs built of heavy timbers, and

their use of hollow concrete blocks filed with sand rather than reinforced concrete in the walls. In addition, the gas decontamination functions were housed in a separate structure (no longer extant) adjoining the casualty station, rather than within the building. Also the presence of blast walls to protect the operating room door and ambulance parking under the porte cochere differentiated these stations from others.

Facility 43 is also important for its associations with the development of the West Loch Naval Ammunition Depot. In 1931 the Navy acquired 213 acres at West Loch from the Campbell Estate, to serve as a branch ordnance depot. This original acreage at West Loch amounted to only about two percent of the acreage set aside for NAVMAG Lualualei. The mission at NAVMAG West Loch included munitions receipt at a small number of assigned shipping berths physically located in West Loch (wharves W1-W5), as well as ordnance inspection and surveillance (checkout and assembly) and storage. Roads and rail lines connected Lualualei and West Loch. On the eve of World War II, the Navy enlarged its Oahu munitions complexes, expanding NAVMAG West Loch to 537 acres. Building 43 serviced the personnel assigned to this station.

Facility 43 Construction and Usage During WW II and the Cold War

The construction work undertaken at West Loch during the months before the Japanese attack on Pearl Harbor and during the early years of the war (including Facility 43) was accomplished under contract NOy-4173. The contract was issued to a consortium of firms known as Contractors Pacific Naval Air Bases (CPNAB) who did construction work in the Pacific for the Navy before and during World War II. CPNAB began construction at West Loch on August 11, 1941 and worked until July 1, 1943 when the contract ended and construction duties were taken over by Navy construction battalions, also known as SeaBee's or CB's. The project manager for the work under NOy-4173 at West Loch Naval Ammunition Depot was Robert M. Belt, Lt. (CEC) USNR. Mr. Belt would go on (with Walter K. Collins) to found the eminent Honolulu planning and civil engineering firm of Belt Collins Hawaii, Ltd. Facility 43 was likely built by the Honolulu contracting firm E.E. Black, Ltd who were responsible for most of the building at West Loch.¹

The design of Facility 43 generally follows the standard plans for a Type D Casualty Station. The standard plans for this type of casualty station were formulated and drawn at Pearl Harbor, under the direction of the 14th Naval District. The plans were drawn by a draftsman named "Harden" under the direction of architect Jozef Van Oort, whose initials V.O. appear on the drawings.² Mr. Van Oort came to Hawaii in 1935 to work on the design for Hickam Airfield, then worked for the Army Corps of Engineers before becoming the chief architect at Pearl Harbor from 1939 until his retirement in 1958. Robert Belt also signed these drawings as Project Manager.

Although Facility 43 is listed in Navy records from WW II with a year built date of 1943,³ CPNAB records indicate it was completed the year before. Facility 43 is listed in the original construction reports as a splinterproof shelter and surgery. It is project number 906 under

¹ Contractors Pacific Naval Air Bases (CPNAB), *Technical Report and Project History Contracts NOy 3550 and NOy 4173*, Microfilm of report Pacific Division Naval Facilities Engineering Command Library. N.d., A-277.

² Naval Facilities Engineering Command (NAVFAC) Pacific Division, Plan files drawings numbered 199650 to 199655, May 14, 1942.

³ U.S. Navy Bureau of Yards and Docks (BuDocks), *Public Works of the Navy Data Book, Buildings, NAVDOCKS P-164, July 1945 Edition*, (Washington D.C.: Dept. of the Navy, 1945), 1096.

contract NOy-4173 and is listed with a final completion date of April 1942.⁴ Additionally, a map showing existing conditions at West Loch Naval Ammunition Depot as of June 30, 1943 (the day before construction work was turned over to the Navy construction battalions) indicates that Facility 43 was completed.⁵

About 60% of the workforce involved in building construction at West Loch under contractor E.E. Black was of Japanese ancestry. This caused some problems after the attack as the workload increased and the Navy Inspector of Ordnance protested the continued employment of ethnic Japanese.⁶ After E.E. Black attempted to hire some Japanese workmen discharged from the Navy Yard after the attack, an order was issued to "disject [sic] all Japanese."⁷ A balance was struck when the Navy barred the contractor from hiring additional Japanese, but only removed certain "aliens considered undesirable."⁸ This left the contractor with most of its original core of workers, primarily Japanese craftsmen.⁹ Although these craftsmen were loyal employees who had been with E.E. Black for a long time, they still needed supervision to work down to Navy specifications for wartime construction. "All framing members, including all bridging and blocking, were pre-cut to exact lengths; but, in spite of this pre-cutting, constant watchfulness was required to prevent the oriental carpenter from making a 'cabinet' job out of fitting fire stops and bridging."¹⁰

War time construction at West Loch Naval Ammunition Depot by CPNAB was extensive. The facilities there ca. 1939-40 were few, consisting of only about thirteen main buildings and structures, railroad tracks, and about 500' of wharf.¹¹ These buildings included housing (three buildings), barracks and messhall, administration, shipping and receiving center, utility shop, crane and locomotive shed, mine anchor storage (two buildings), mine assembly, and railroad barricades (two structures). CPNAB construction added about 140 buildings, structures and magazines and about sixty-eight Quonset huts. The buildings and Quonsets were concentrated into three main areas; one near the main gate, another north of the main gate along the shores of the West Loch Channel, and a third cluster south of the original wharf and Powder Point. The magazines were built in the outlying area south and east of the clusters of buildings. Additionally, the original wharf was lengthened to about 1500' and another wharf (approximately 1200' long) was built about ½ mile to the east to service the magazines.¹²

Facility 43 was built with a slight variation of the standard design for Type "D" Casualty Stations. The ambulance drive on the northwest end of the building was originally unroofed instead of the typical Type D roofed ambulance drive that was splinterproofed by a concrete slab on the roof. Also varying from the typical design, the hollow concrete tile outer wall that defines the ambulance drive does not extend the entire width of the building, as in other casualty stations of this type. At Facility 43 the ambulance drive is defined by a wall only about 30' long. Sometime before September 1951 a wood-sheathed roof was extended out from the building to this 30' long outer wall of the ambulance drive.

⁴ CPNAB, *Technical Report*, A-273.

⁵ Ibid., A-278p.

⁶ Ibid., A-289.

⁷ Ibid., A-297.

⁸ Ibid.

⁹ Ibid., A-296 & 297.

¹⁰ Ibid., A-297.

¹¹ Hawaii State Archives Aerial Photo Collection, photo # M-4.25 in folder PPA 39-2, ca. 1939-40. And NAVFAC Plan files drawing numbered 109802, March 3, 1931.

¹² NAVFAC Plan files drawing numbered OA-N1-1539, June 30, 1946.

Although Facility 43 is a Type "D" Casualty Station, it appears that from immediately after it was built it was referred to as a dispensary.¹³ This indicates the changing use of the building between the time it was designed and when it was completed, reflecting the shifting of combat operations in the Pacific westward which greatly lessened the chance that Oahu would again come under air attack from the Japanese. Labeling Facility 43 as a dispensary from the beginning indicates that it was intended to supply routine medical care to the personnel stationed at West Loch, and not primarily as a triage and casualty stabilization area for wounded.

Although spending most of its life as a dispensary, Facility 43 did actually serve as a casualty station on May 21, 1944 when a series of explosions occurred in a fleet of thirty-four LST vessels (Landing Ship, Tank) that were berthed across West Loch Channel, north of the Naval Ammunition Depot. These LSTs were berthed at Tare wharfs between Hanaloa Point and Intrepid Point at the mouth of Walker Bay, just across West Loch Channel from the Naval Ammunition Depot and were preparing to begin Operation Forager, the invasion of the Marianas. The LSTs were stuffed with ammunition and drummed fuel. At Tare 8, aboard LST 353 which was moored in a nest of eight LSTs there, unneeded ammunition for 4.2" mortars was being offloaded onto trucks for barging to shore. At 3:08 in the afternoon an explosion of either ammunition or gasoline on this LST triggered a chain of blasts and fires that engulfed five of the LSTs in the nest. Although many casualties that went into the water made it to the near shore on the north side of West Loch Channel at Waipio Peninsula and were transferred to hospitals at Pearl Harbor Naval Base, many sailors and Marines went into the waters of the West Loch Channel south of the fleet and were rescued by small craft, taken to the West Loch Naval Ammunition Depot wharfs and then transferred to Facility 43 for emergency treatment.¹⁴ The LST explosions and fires at Tare wharfs claimed 163 lives and wounded 396. Six LSTs were lost, but the attack force sailed from Pearl Harbor only one day behind schedule and Operation Forager was a major victory for U.S. amphibious forces. Information about the disaster was classified until 1960.

Facility 43 remained listed as a dispensary throughout much of the Cold War, until at least 1974.¹⁵ During this period the building was used to house the facilities that provided routine medical care to the military personnel assigned to the West Loch Naval Ammunition Depot. As the depot was associated with special weapons during the late 1950s thru the mid 1960s and again in the late 1970s, Facility 43 is likely to have also been equipped to deal with the initial triage and stabilization of any medical emergencies relating to the nuclear munitions stored and maintained there.

West Loch and the Korean War

After the end of World War II, NAVMAG West Loch continued its war time role as a storage and handling site for the Navy's conventional munitions. The tasks and duties involved here dwindled with the end of the war until the advent of the Korean War (June 1950 –July 1953) which prompted a surge in activity. The decrease in conventional munitions activity here was largely due to the shortage in personnel during the years after WW II as service men were released back to their civilian lives. This shortage of manpower lead to the military devoting fewer resources to what appeared to be minor items such as maintaining equipment left over from WW II. Coupled with the perceived economy of the atomic bomb where one weapon was

¹³ CPNAB, *Technical Report*, A-278p.

¹⁴ William C. Johnson, *The West Loch Story*, (Seattle: Westloch Publications, 1986), 40, 41, 54, 159.

¹⁵ U.S. Navy. *Detailed Inventory of Naval Shore Facilities P-164*. (Washington D.C.:U.S. Navy, 1974), 54.

seen as doing the work that previously took an entire navy, military preparedness for a conventional conflict languished until Korea, when all branches of the military were caught short and quickly tried to bolster their capabilities. This increase in the volume of naval munitions passing through West Loch during the Korean War likely did not include naval mines, due to the fact that although newer more sophisticated mines were developed in the ensuing years after WW II, the United States did not engage in any naval mining activities in Korea. The only association the U.S. had with naval mines during that conflict was with its minesweeping and other mine countermeasures employed against the extensive network of Soviet mines used in North Korea's defensive mining campaign. With the end of the Korean War came another drawdown in naval weapons activity at West Loch due to the trend of the Navy to place more emphasis on its forward Pacific locations such as Guam and the Philippines.

Special Weapons and Eisenhower's "New Look"- the Regulus I Missile

By about the mid 1950s this post-Korean War drawdown of conventional weapons at West Loch seemed to fit with President Eisenhower's "New Look" national security policy which emphasized a reliance on tactical nuclear weapons while maintaining a modestly sized military that was economically justified and supportable by the nation's economy. For West Loch this meant a series of facilities that would support the Regulus I cruise missile, a nuclear-capable weapon that became operational on surface ships in 1955. The missile was deployed from a submarine, the USS *Tunny* (SS 282), in 1956, and in May 1957 the *Tunny* arrived at Pearl Harbor carrying Guided Missile Group (GMG) 91, which was headquartered at the Pearl Harbor Submarine Base.¹⁶

Support facilities for the new Regulus I missile utilized aboard the submarines home-ported at Pearl Harbor were initially (in 1956) to have been constructed at Lualualei.¹⁷ But by early 1957 the location for the permanent support facilities for Regulus I (including magazines and missile checkout and assembly facilities) had been changed to NAVMAG West Loch. Drawings produced in January 1957 by the renowned Honolulu firm of Belt, Lemmon, and Lo Architects & Engineers indicate a planned "Guided Missile Facility" there.¹⁸ Belt, Lemmon, and Lo would later work on many important buildings in Honolulu including the Hawaii State Capitol Building (1968) and the Prince Kuhio Federal Building (1977).

The Regulus I Guided Missile Facility complex at West Loch contained five facilities to support the missiles:

- Facility 440, Test and Checkout Building, the principal missile assembly and check-out area;
- Facility 441, Ready Issue Facility, a holding area accessed from Fac. 440 by a covered walkway;
- Facility 442, Igniter Test Building ,(no longer extant);
- Facility 443, Transformer Station;
- Facility 444, Utility Building.

The main component of the Regulus I complex, Facility 440, contained checkout bays for three missiles. The bays each measured about 15' wide x 37' long, which would be of sufficient size to hold a missile with its wings folded, when its width was 9'-10½" (width was 21'-0" with wings

¹⁶ Mark Waters, " Oahu Tabbed as Major Guided Missile Center," *Honolulu Star Bulletin*, April 9, 1957.

¹⁷ "Navy to Build Rocket Fleet Here," *Honolulu Advertiser*, January 20, 1956.

¹⁸ NAVFAC Plan files drawings numbered 751102 to 751178, January 7, 1957.

extended). The fuselage length of the missile was 32'-2" but the overall operational length increased to 41'-6" with the addition of a thin projecting pitot tube on the front of the missile. The Igniter Test Building (Fac. 442) was located about 600' from Facility 440 & 441.

Also shown on the site plan for the Regulus I complex at West Loch were three very large areas, roughly rectangular, measuring from about 400' x 400' to about 500' x 600' and labeled "depressed area[s]" on the plan. It is not known what these areas were to be used for. They appear to each be surrounded by a berm with their entry roadways shielded by having the road penetrate through the berm in a shallow angle. The entries were also flanked by tapering sections of the berm, as if to prevent a blast from escaping laterally from the depressed area.¹⁹ The original site plan also indicates that a second set of buildings, another Test and Checkout Building with its attached Ready Issue Facility, were planned for the complex. These were never constructed.

The available 1957 plans for the Regulus I complex at West Loch do not include any provision for storage of munitions or warheads. Typically, the magazines storing nuclear warheads were located at the complexes that serviced and prepared their associated delivery systems. In the case of the Regulus I missile complex at West Loch, it is most likely that the warheads for the missiles would have been stored in magazines at NAVMAG West Loch, possibly in converted World War II magazines.

The Regulus I missile was able to use two types of nuclear warheads as payload inside its 4'-8½" diameter fuselage; the W-5 fission warhead with a variable yield of from 6 to 120 Kt, or the W-27 thermonuclear warhead with a yield of 2Mt. The W-5 was available in two different sizes, one with a diameter of 3'-3" and other with a diameter of 3'-8"; each was 6'-4" long. The weight of the W-5 warhead varied from 2,405 lbs. to 2,600 lbs. The W-27 was of similar size, 2'-7" in diameter and 6'-3" long and weighed 2,800 lbs.

At the time the Regulus I complex at West Loch was being planned (plans were prepared in January 1957), nuclear fission weapons design was transitioning from an open pit to a sealed pit type. The older open pit type weapons, including the W-5 warhead which was carried in the Regulus I missile, had a central core (or pit) of fissile material, (usually Plutonium-239) that was stored separately from the rest of the warhead and only assembled very shortly before use. This separate storage was necessary because of two factors; first, the radiation from the pit degraded other critical components of the warhead, and second, the polonium metal initiator at the center of the pit (which provided neutrons to reliably start the nuclear chain reaction when detonated) had a very short half life which would cause it to lose potency if too long a time passed between its manufacture and use. This open pit design of all pre-1957 weapons meant that besides providing storage magazines for the main warhead, provisions must be made for nearby storage of their pits of fissionable material, again likely at West Loch's magazines. In open pit design weapons, the pits were inserted onto the warhead just prior to launch, so Facility 440 would not have been used for this purpose. The pits of the W-5 warheads on Regulus I missiles were more likely to have been specified to be inserted while the missiles were on the submarines, just before the missiles would be fired. In aircraft weapons, this arming of the warhead by inserting the pit during flight (either manually or mechanically) was known as in-flight-insertion (IFI). It is not known what type of pit design the W-27 thermonuclear warhead utilized, but its dates of manufacture, from August 1958 to September 1959, and its

¹⁹ Ibid.

thermonuclear mechanism suggest that it was a sealed pit design which would be stored as a complete assembled warhead.

At least two years passed between the preparation of plans for the Regulus Missile complex at West Loch (January 1957) and its construction (completion ca. 1959). During this time it is not clear that the facilities were even funded as late as December 1958. That month a 14th Naval District prioritized list of construction projects describes it as a "Guided Missile Support Facility (Secret)" for fiscal year 1961 and indicates its estimated cost at \$1,295,000.²⁰

During the time between the arrival of GMG 91 at Pearl Harbor in May 1957 and the completion of the Regulus I complex at West Loch it is most likely that some type of temporary support facility for the missiles was set up at NAVMAG Lualualei. Possibly with the nuclear warheads and pits stored at cave magazines at Kipapa Gulch, Waikale.

Regulus I missile patrols ended in 1964 and the missile was removed from patrol service. Shortly after, in February 1965, drawings were prepared for a 74'-0" x 85'-0" addition to Facility 440 that consisted of four 15' wide test cells. These test cells had 5'-0" thick sand-filled walls along one 15' wide end and along 28'-9" of their length. They were also equipped with knock-out blast panels along the opposite 15' wide end with thrust retainers near them.²¹ This building addition is unusual, coming after the Regulus I missiles were withdrawn, but the cells might have been used for the deactivation of the missiles. Regulus I missiles were used as target drones after they were removed from patrol service. During the period of time from their construction in 1959 and the withdrawal of the Regulus I missile from service in 1964, West Loch Facilities 440, 441, 442, 443, and 444 were an important part of this crucial element of deterrence during the Cold War.

West Loch and Anti-Submarine Warfare

In 1962 a complex of buildings was constructed at West Loch for another Cold War mission, four buildings that were associated with anti-submarine warfare (ASW) and the Mk 46 ASW torpedo. Plans for this ASW support facility were prepared in May 1960 by the firm Daniel, Mann, Johnson & Mendenhall Architects and Engineers. This firm, with offices in Los Angeles and Honolulu, was responsible for many important military construction projects beginning in the mid 1950s, including fueling systems, runways, housing, recreational buildings, and missile launch facilities at Cape Canaveral, Florida, and Vandenberg, California.

The ASW support complex at West Loch included four buildings to support the Mk 46 torpedo:

Facility 453, Mk 46 Checkout and Assembly building;

Facility 454, Transformer building;

Facility 455, Sentry Booth (no longer extant);

Facility 456, Control Center and Standby Generator building (no longer extant).

The buildings of this ASW support complex were located inside of a security fence that was constructed in mid-1960, enclosing the Regulus I complex. The new Sentry Booth became the entry point for the fenced area, and served both the new ASW and the previous Regulus I

²⁰ United States Navy, 14th Naval District, *Shore Station Development Program Fiscal Year 1961*, (San Bruno, CA: National Archives and Records Administration, December 12, 1958).

²¹ NAVFAC Plan files drawings numbered 1069197 & 1069198, February 5, 1959.

facilities. The newly built Control Center and Standby Generator building also served both groups of buildings.²²

The Mk 46 torpedo supported by the ASW complex at West Loch was a conventional (non-nuclear) weapon, about 12¾" in diameter, which used a Mk 103 warhead containing 98lbs. of conventional explosive, PBXN-103. This acoustic homing torpedo, designed to be launched from surface ships and aircraft, entered service in 1963 as the Mk 46 Mod 0. This variant of the torpedo featured a solid fuel motor and was produced in limited numbers because of maintenance problems with this solid fuel propulsion system. Its replacement, the Mk 46 Mod 1 was already in development in 1962; it featured a mono-propellant, liquid fueled (Otto fuel) piston engine (either cam or swashplate) of axial design that drove counter-rotating propellers. Besides eliminating the maintenance problems of the Mod 0, this engine gave the Mk 46 Mod 1 (and subsequent Mods, 2-5) torpedo better speed and range with a top speed of about 45 knots, enabling it to pursue high performance submarines at the time it entered service in 1967. The Mk 46 torpedo has a long operational life, being used through the end of the Cold War in 1991 and is currently still in service.

The original 1960 plans for Facility 453 indicate a 26'-8" x 66'-4" section of the building was designated as "Missile Test & Assembly Area." This area possibly supported the Anti-Submarine Rocket (ASROC) system, the Navy's main shipboard standoff anti-submarine weapon from about 1960 (when it was equipped with the Mk 44 torpedo). The ASROC system used a solid fuel rocket to propel a torpedo (or a depth charge) on a ballistic trajectory to a point over the position of an enemy submarine. It had a range of 900 yards to ten miles and a speed of mach 1. When the rocket motor ended firing it was separated from the torpedo, which deployed a parachute, descended into the water and homed toward the target. In 1965 the ASROC replaced the Mk 44 torpedo with the Mk 46.

Plans prepared in August 1969 detail the alteration of Facility 440 at West Loch to a Torpedo Overhaul Facility.²³ This conversion of the former Regulus I Test and Checkout building was accomplished to provide a dedicated building for working on the Mk 48 torpedo, which came into service in 1972. The Mk 48 is a large weapon, 21" in diameter and 19'-0" long that carried a conventional warhead of 650 lbs. of PBXN-103 explosive. The Mk 48 torpedo is fired from submarines and is used to attack fast, deep diving nuclear submarines and high performance surface ships.

In 1988 another addition was built on Facility 440 to support the Mk 48 ADCAP (Advanced Capability) torpedo.²⁴ This torpedo was developed from the earlier Mk 48 to counter the threat of the Soviet ALFA class submarines; titanium hulled and powered by liquid metal-cooled reactors, the ALFAs could operate at a depth of 2,500' and had a top speed well in excess of 40 knots. The Mk 48 ADCAP features enhanced guidance & control modifications and fuel flow improvements to the Otto fueled piston engine that allowed a top speed estimated at 63 knots.

Also in 1988, another building at West Loch, Facility 543, was renovated for use as a Mk 46 torpedo shop.²⁵ This building was built in 1977 as a torpedo preparation facility. The 1988 renovations dedicated it for use in conjunction with the Mk 46, they included; drum storage, fueling/defueling, and afterbody dirty room (possibly built as areas to work with the toxic Otto

²² NAVFAC Plan files drawings numbered 884465 to 884505, May 19, 1960.

²³ NAVFAC Plan files drawings numbered 1311446 to 1311502, August 25, 1969.

²⁴ NAVFAC Plan files drawings numbered 7087196 to 7087323, November 30, 1988.

²⁵ NAVFAC Plan files drawings numbered 7053962 to 7053987, May 5, 1987.

fuel that was used in the Mk 46 engine), supply room, concrete equipment pads, darkroom, computer room, and mechanical room.²⁶ The renovations to this building could have been designed to support the Mk 46 Mod 5 torpedo, which came into service ca. 1984 and was an extensive overhaul of previous Mk46 versions that was undertaken by the Honeywell Corp. and enabled the torpedo to attack surface ships.

West Loch and Special Weapons after 1979

After being associated with special weapons (Regulus I) from about 1959 to 1966, and then supporting sophisticated conventional explosive torpedoes (Mk 46 & Mk 48) from about 1966 onward, a special weapons mission once again returned to West Loch ca. 1979 with the construction of additional magazines (Facility 490-537) and a final checkout and assembly building (Facility 489). Although the specific (special) weapons stored and supported in these facilities cannot be verified, it can be assumed that they were weapons deployed on the submarines that utilized Pearl Harbor as their home port between 1979 and 1991. During this time, the Pacific was patrolled by submarines of the *Lafayette* and *Benjamin Franklin* classes, carrying the Poseidon ballistic missile. In the late 1970s, Poseidon ballistic missile submarines, along with the earlier Polaris ballistic missile submarines, made up one part of the U.S. nuclear triad of strategic weapons systems (which also included intercontinental ballistic missiles & strategic bombers) that supported the important defense doctrine of mutual assured destruction (MAD). This doctrine was based on the theory that no nation will initiate a nuclear war if the opposition has the ability to retaliate massively and inflict unacceptable damage. The ballistic missile submarines, by virtue of their impregnability when deployed, were a very significant portion of this doctrine as the uncertainty of their position ensured that they would survive a first strike to deliver a retaliatory response with their missiles.

The Poseidon missile carried the W-68 nuclear warhead (dimensions not known), each of which carried ten independently targetable reentry vehicles with variable yields of from 40-50 Kt. The warheads were manufactured between 1970 and 1975 and the last was retired in 1991. About 5,250 W-68 warheads were produced, making it the largest production run of any U.S. nuclear warhead.

Another nuclear-capable missile that was deployed on submarines home-ported at Pearl Harbor is the Tomahawk submarine-launched cruise missile (SLCM). This missile was first deployed in 1983 and was designed to utilize conventional or nuclear warheads, including the W-80-0, a variable-yield nuclear warhead of between 5 to 200 Kt. Production numbers of this warhead, between 1983 and 1990, was 367. The W-80-0 is about 12" wide and about 31½" long. In 1984 thirteen submarines based at Pearl Harbor were equipped with Tomahawk missiles; the USS *Los Angeles*, *San Francisco*, *New York City*, *Indianapolis*, *Bremerton*, *Omaha*, *Tunny* (SSN 682), *Cavalla*, *Queenfish*, *Hawkbill*, *Aspro*, *Tautog*, and *Puffer*.²⁷

The Tomahawk missile itself is highly accurate and can fly hundreds of miles at low altitudes to strike. This makes it very difficult to counter by enemy forces and gives it great survivability. It came into service at a time when U.S. tactical and strategic weapons were acquiring new levels of targeting accuracy. This prompted a shift in U.S. defense policy (which only came to fruition after the end of the Cold War) away from the MAD defense philosophy to a more traditional posture of relying on the certainty of accurate strikes against military targets to deter potential enemies from attacking.

²⁶ Ibid.

²⁷ Jim Borg, "13 Pearl-Based Submarines to get Tomahawk Missiles," *Honolulu Star Bulletin*, July 15, 1984.

PART III. SOURCES OF INFORMATION

A. Architectural Drawings:

Historic drawings are available as electronic scans only, and can be viewed on the NAVFAC Pacific Plan File data base at Building 258, Makalapa, Pearl Harbor. Scans can be viewed and printed on 11" x 17" paper only.

B. Early Views:

Aerial photos are available in the aerial photo collection and the Admiral Furlong Collection at the Hawaii State Archives (HSA). The photos of the Admiral Furlong Collection were taken under the direction of Admiral William R. Furlong, Commandant of the Pearl Harbor Navy Yard. These photos were created by a U.S. federal agency (U.S. Navy) and are considered in the public domain.

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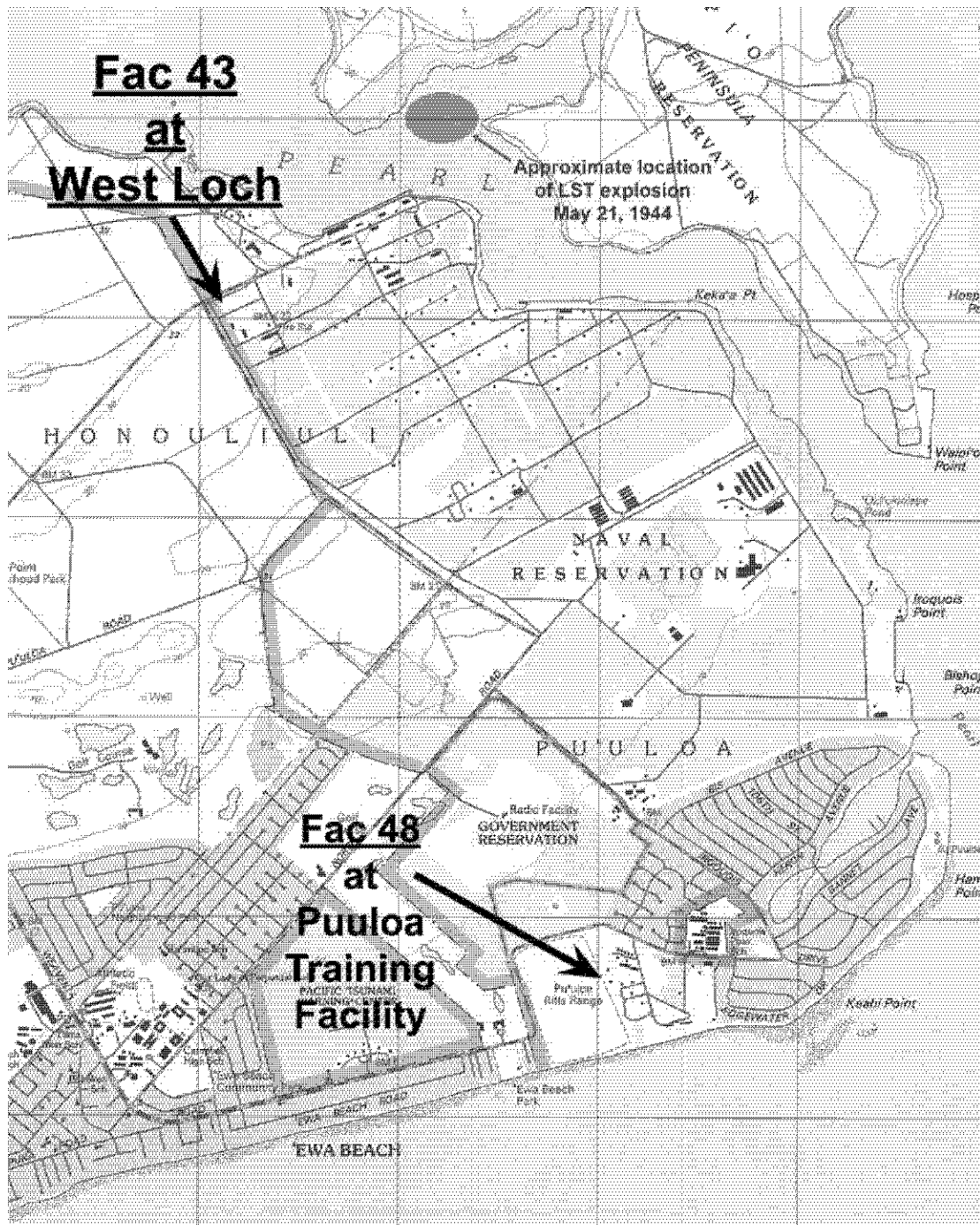
PART IV. PROJECT INFORMATION:

The demolition of Facility No. 43 as part of the CNIC Demolition Footprint Reduction Program has been proposed by the Navy. In accordance with 36 CFR Part 800, implementing regulations of Section 106, National Historic Preservation Act, Commander Navy Region (COMNAVREG) Hawaii has consulted with the Hawaii State Historic Preservation Officer (SHPO) and other consulting parties. This photo documentation and recordation is a partial fulfillment of the mitigations stipulated in the Memorandum of Agreement among COMNAVREG Hawaii and SHPO.

This report was prepared under a Historic Preservation Services contract (N62742-06-D-1869) awarded to Wil Chee Planning, Inc., the prime contractor, by the U.S. Navy, Pacific Division, Naval Facilities Engineering Command. This project is being supervised by Jeffrey Dodge, Historical Architect, NAVFAC Hawaii. The photographic documentation was undertaken by David Franzen, photographer. The field work was conducted for this report by Don Hibbard in December 2008.

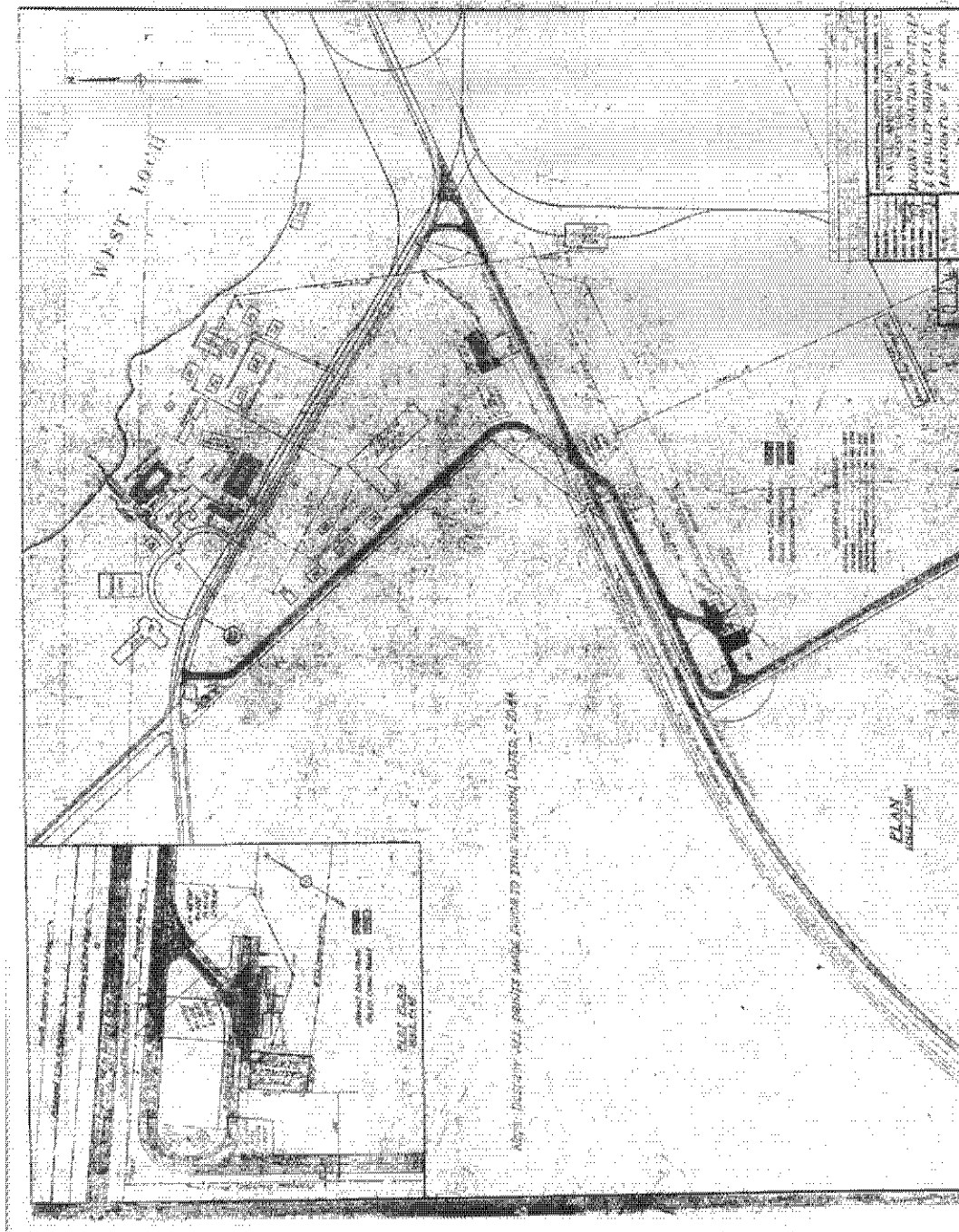
U.S. NAVAL BASE, PEARL HARBOR,
NAVAL AMMUNITION DEPOT WEST LOCH, OAHU, DISPENSARY
(U.S. Naval Base, Pearl Harbor, Medical Clinic)
(Facility No. 43)
HABS No. HI-161 (Page 18)

Location map for Facility 43 at West Loch. The location of Facility 48 at Puuloa Training Facility is also shown, this is another Type D Casualty Station which was photographed for this report (see photo index).



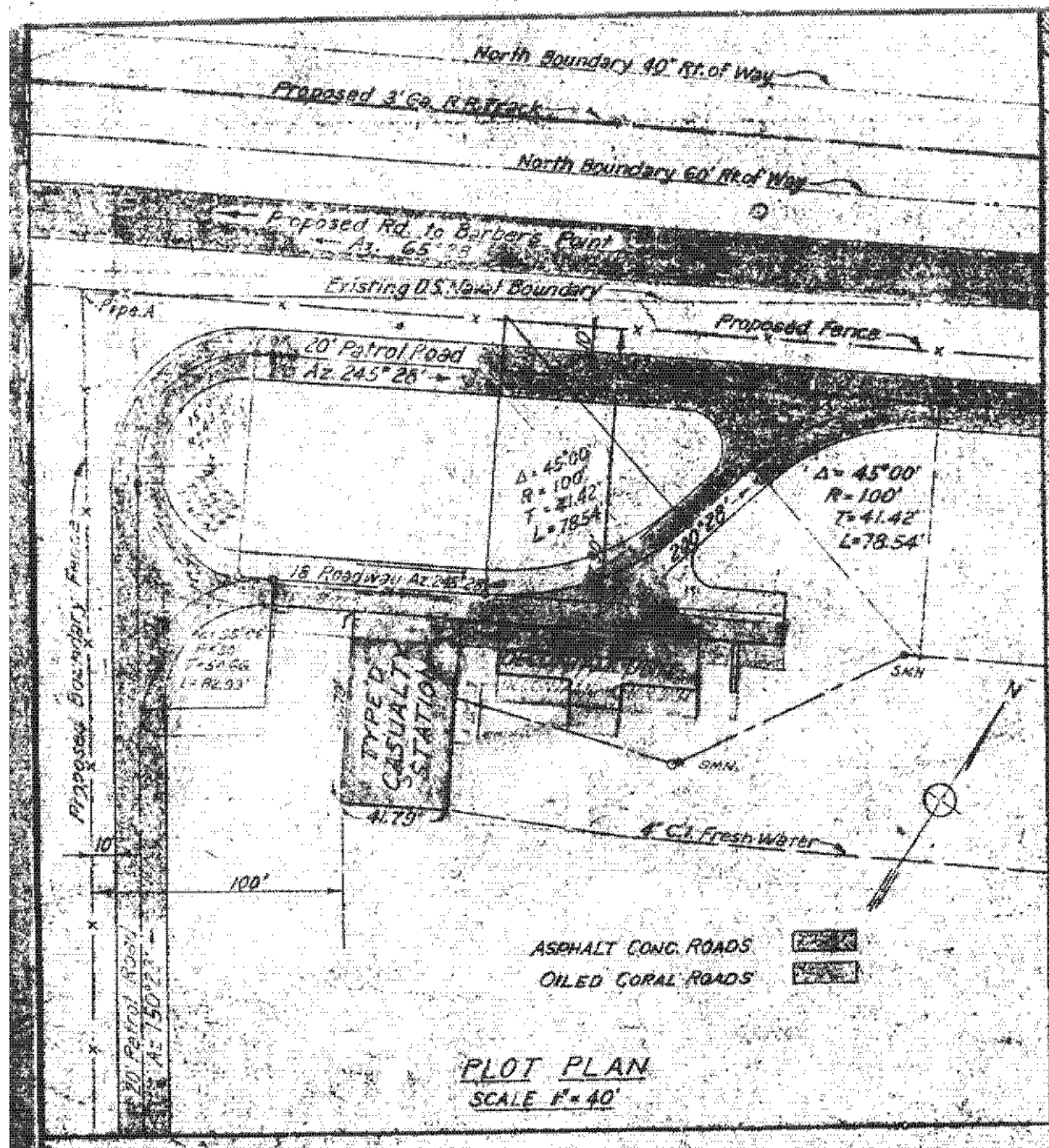
U.S. NAVAL BASE, PEARL HARBOR,
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Drawing dated May 20, 1944 showing the location plan of Facility 43. NAVFAC drwg OA-N9-614. Not to scale.



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Portion of drawing dated May 20, 1944 showing a detail of the plot plan for Facility 43 and its original associated decontamination unit. NAVFAC drwg OA-N9-614. Not to scale.



U.S. NAVAL BASE, PEARL HARBOR,
NAVAL AMMUNITION DEPOT WEST LOCH, OAHU, DISPENSARY
(U.S. Naval Base, Pearl Harbor, Medical Clinic)
(Facility No. 43)
HABS No. HI-161 (Page 21)

Map showing the build out of the West Loch Naval Ammunition Depot during WW II.
Highlighted areas (added) indicate the main buildings and structures that existed there ca.
1939-40. Map derived from NAVFAC drwg OA-N1-1539, June 30, 1946.

